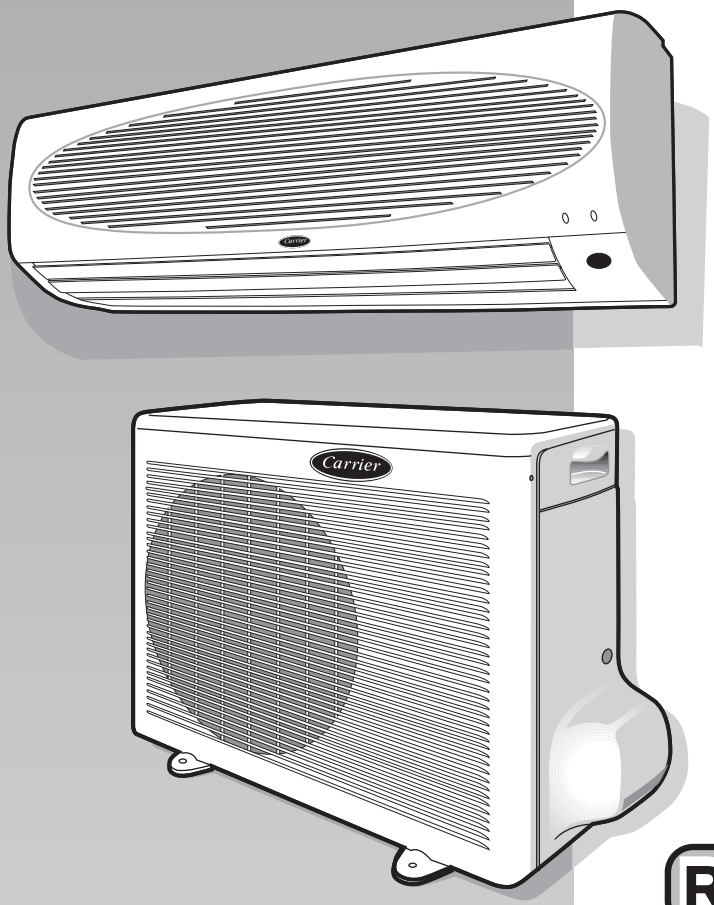
Carrier

42PQV/38VBH



R-410A

INSTALLATION MANUAL

42PQV/38VBH
1:1 inverter Heat pump system

ENGLISH

For operation and maintenance instructions of this unit as well as installation instructions, refer to owner's manuals.

Contents

	Page
General information	2
Dimensions and weight	3
Connections	3
Minimum clearances and operating limits	4
Material supplied and system charge	5
Choosing the installation site	6
Warnings: avoid	7/8
Installation for indoor unit	9/10
Refrigerant connections	11/13
Check	14
Electrical connection for indoor unit	15
Electrical connection for outdoor unit	16
Electrical connection	17
Electrical data	17
Pump down and refrigerant cycle	18
Operating test address selector and fault code	19
Unit configuration, remote configuration, guide for owner and accessories	20
Maintenance and Troubleshooting	21

ATTENTION INSTALLERS AND SERVICE TECHNICIANS!
AIR CONDITIONER WITH R-410A – QUICK REFERENCE GUIDE

- R-410A refrigerant operates at 50%-70% higher pressures than R-22. Be sure that servicing equipment and replacement components are designed to operate with R-410A.
- R-410A refrigerant cylinders are pink.
- R-410A refrigerant cylinders have a dip tube which allows liquid to flow out with the cylinder in a vertical position with the valve at the top.
- R-410A systems should be charged with liquid refrigerant. Use a commercial type metering device in the manifold hose in order to vaporize the liquid refrigerant before it enters in the unit.
- R-410A, as other HFCs, is only compatible with oils selected by the compressor manufacturer.
- A vacuum pump is not enough to remove moisture from oil.
- Oils absorb moisture rapidly. Do not expose oil to atmosphere.
- Never open system to atmosphere while it is under vacuum.
- When the system must be opened for service, break vacuum with dry nitrogen.
- Do not vent R-410A into the atmosphere.
- Use only Carrier matching indoor units and outdoor units (Table I).

Table I

Indoor unit	Outdoor unit	Power supply	Oil type	Quanty cc
42PQV009	38VBH009	220-240V, 50/60Hz	PVE	440
42PQV012	38VBH012		PVE	550

General information

Unit installation

Read this instruction manual thoroughly before starting the installation.

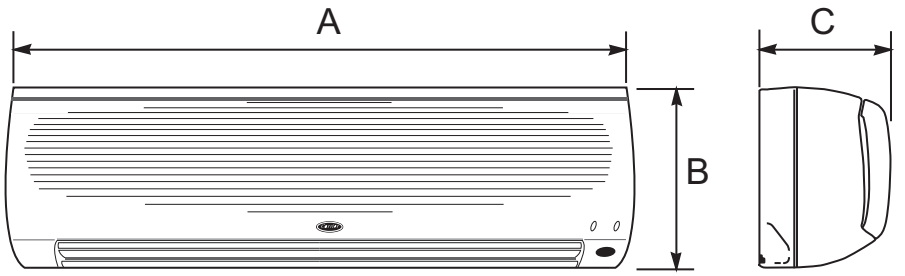
- **This equipment contains R-410A refrigerant, a substance that is not depleting the ozone layer but must be disposed of in a proper manner. When disposing of the unit after its operational life, remove it carefully.**
  The unit must be delivered to an appropriate disposal center or to the original equipment dealer.
- **Carefully recover refrigerant within this unit before final disposal or When servicing. Never vent refrigerant to atmosphere.**
- **R410A systems operate at higher pressures than standard R22 systems.**
  Do not use R-22 service equipment or Components on R410A epuipment.
- **This unit complies with low-voltage (EEC/72/23) and electro-magnetic compatibility (EEC/89/336) directives.**
- **Check that the impedance of the mains power supply is in conformance with the unit power input indicated in the electric data table IV, on page 17 (EN 61000-3-11)**.
- The installation must be carried out by a qualified installer.
- Follow all current national safety code requirements.
  In particular ensure that a properly sized and connected ground wire is in place.
- Check that voltage and frequency of the mains power supply are those required for the unit to be installed; the available power must be adequate to operate any other possible appliances connected to the same line.
  Also ensure that national safety code requirements have been followed for the mains supply circuit.
- The mains supply must be connected to the indoor unit.
- Connect indoor and outdoor units with field-supplied copper pipes by means of flare connections.
  Use insulated seamless refrigeration grade pipe only, (Cu DHP type according to ISO1337), degreased and deoxidized, suitable for operating pressures of at least 4200kPa and for burst pressure of at least 20700kPa.
  Under no circumstances must sanitary type copper pipe be used.
- Where necessary, used field-supplied 16-17mm I.D. PVC pipe of appropriate length and with the correct thermal insulation for the condensate drain extension.
- After the installation thoroughly test system operation and explain all system functions to the owner.
- Leave this manual with the owner for consultation during future periodic maintenance.
- Use this unit only for factory approved applications: **the unit cannot be used in laundry or steam pressing premises. Outdoor unit is suitable for outdoor installation.**
- Coupling units which have different control systems, may cause irreversible damage and void the warranty protection.
  The manufacturer declines any liability for system malfunction resulting from unapproved coupling.

IMPORTANT:
During the unit installation make first refrigerant connections and then electrical connections. If unit is uninstalled first disconnect electrical cables, then refrigerant connections.

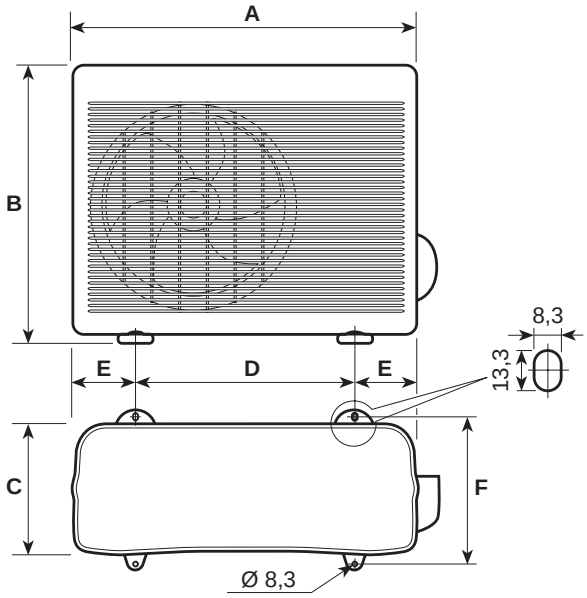
WARNING:
Disconnect the mains power supply switch and wait over 2 minutes without touching any internal parts of the unit before servicing the system or handing any internal parts of the unit.

- The manufacturer declines any liability for damage resulting from modifications or errors in the electrical or refrigerant connections.
- Failure to observe the installation instructions or use of the unit under conditions other than those indicated in Table III “Operating limits”, will immediately void the unit warranty.
- Failure to observe electric safety codes may cause a fire hazard in case of short circuits.
- Inspect equipment for damage due to improper transportation or handling: file an immediate claim with the shipping company.
  Do not install or use damaged units.
- In case of any malfunctioning turn the unit off, disconnect the mains power supply and contact a qualified service engineer.
- Maintenance of the refrigerant circuit must only be carried out by qualified personnel.
- Do not open the remote control to avoid possible damage.
  In case of malfunctioning contact a qualified service engineer.
- Control batteries contain polluting elements.
  When exhausted they must be disposed of according to local requirements.
- **All of the manufacturing and packaging materials used for your new appliance are compatible with the environment and can be recycled.**
- Dispose of the packaging material in accordance with local requirements.

42PQV/38VBH
Dimensions and weight

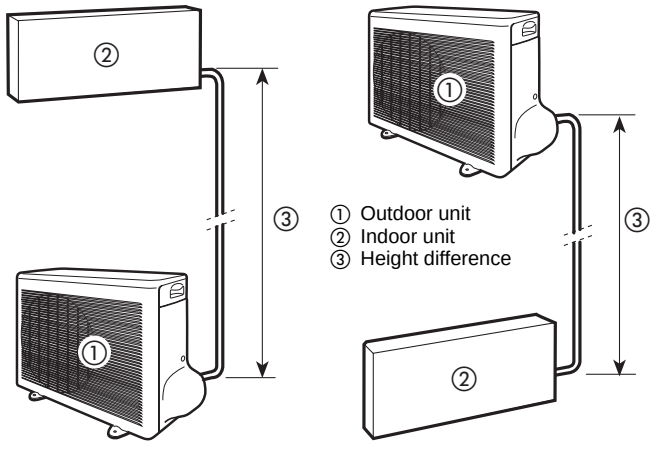


Mod.	42PQV
A mm	790
B mm	260
C mm	186
kg	8.6



Mod.	38VBH
	009 / 012
A mm	750
B mm	590
C mm	280
D mm	470
E mm	140
F mm	310
kg	33 - 37

Table II : Connections



Model	009	012
Max.height difference	8	10
Max.pipe length	10	15

Model	Pipe diameter mm		Pipe diameter inches	
	Gas (Suction)	Liquid (Liquid)	Gas (Suction)	Liquid (Liquid)
009	9.52	6.35	3/8”	1/4”
012	12.7	6.35	1/2”	1/4”

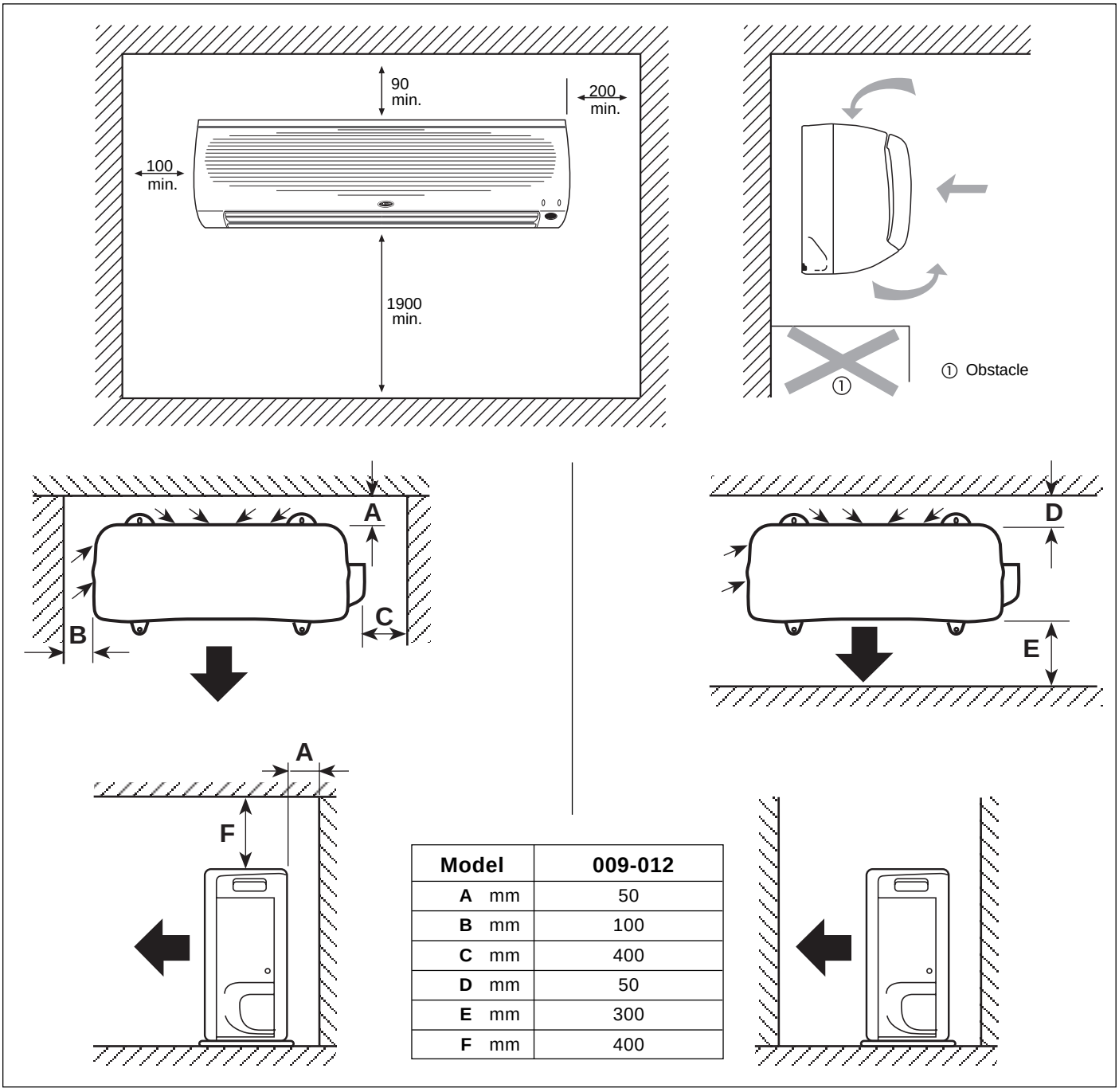
Minimum nominal thickness	
Pipe diameter inches-mm	Minimum nominal thickness(mm)
1/4”-6,35	0,80
3/8”-9,52	0,80
1/2”-12,70	0,80

All fittings are flare type.

Use only refrigeration grade pipes, (Cu DHP type according to ISO 1337), seamless, degreased, deoxidized and suitable for operating pressures of at least 4200 kPa and with a burst pressure of 20700kPa.
Under no circumstances must sanitary type copper pipe be used.

42PQV/38VBH

Minimum clearances and operating limits



Model	009-012
A mm	50
B mm	100
C mm	400
D mm	50
E mm	300
F mm	400

Table III: Operating limits (1)

Cooling	Maximum conditions	outdoor temperature 46°C
		indoor temperature 32°C d.b.; 23°C w.b.
	Minimum conditions	outdoor temperature 15°C
		indoor temperature 21°C d.b.; 15°C w.b.
Heating	Maximum conditions	outdoor temperature 24°C d.b.; 18°C w.b.
		indoor temperature 27°C d.b.
	Minimum conditions	outdoor temperature –10°C d.b.
Mains power supply	Nominal single-phase voltage Operating voltage limits	220V-240V, 50/60Hz **min. 198V – max. 264V**

Notes: 1. Data referred to the outdoor unit only.

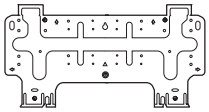
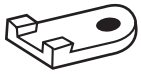
d.b. - dry bulb; **w.b.** - wet bulb

WARNING:
During heat pump operation unit will undergo several defrost cycles to eliminate ice that might possibly collect on the outdoor unit in very low ambient temperatures. In these cycles, fan speed will automatically stop, louvre(flap) will be fixed at horizontal position and cannot be varied until defrost cycle is completed.

Material supplied and system charge

Material supplied

The following installation accessories are supplied with unit. Use them as required.

NAME and shape	Q.ty	Use
Wall hanging bracket 	1	For indoor unit installation.
Screws 4xL10	2	For fixing unit and hanging bracket
Screws anchors and screws 6xL25 Washers Ø 12	4 + 4 + 4	For wall hanging bracket installation.
Drain fitting	1	For drainage of outdoor unit.
Mounting rubber 	4	For outdoor unit installation.

The following field-supplied items are required to complete the installation.

Name	Specification
Connection pipe	009: Ø (3/8") 9.52 mm (Gas) / Ø (1/4") 6.35 mm (Liquid) 012: Ø (1/2") 12.7 mm (Gas) / Ø (1/4") 6.35 mm (Liquid)
Wall sleeve	
Wall cap	
Finishing tape	PVC film
Fastening tape	
Pipe insulation	
Drain hose	I.D. 16-17 mm
Sealer putty	
- Power supply cable	H07RN-F or higher
- Electrical connecting cable between indoor and outdoor unit	Cable type: H07 RN-F, synthetic rubber insulation with Neoprene coating, according to EN 60335-2-40 codes.

System charge

Size	Refrigerant charge (g)	Suitable up to (m)	Maximum pipe lenght (m)	Maximum pipe elevation (m)
009	720	10	10	8
012	1100	15	15	10

1. This appliance is designed to be used without additional refrigerant charge up to 10m for 42PQV009 and 15m for 42PQV012. There is no need to charge and extract additional refrigerant according to the connecting pipe length within maximum pipe length.
2. In case of refrigerant charging due to refrigerant leak or service, charge exact amount of refrigerant using scale after evacuate the unit with vacuum pump.
3. For reference, discharge/suction pressure at various temperature conditions and a rated compressor speed are provided service manual.
   Never charge and extract the refrigerant depending on discharge/suction pressure. This unit is inverter system whose compressor speed is variable.

42PQV/38VBH

Choosing the installation site

Indoor unit

Positions to avoid:

- Exposed to direct sun.
- Too close to heat sources.
- On humid walls or positions with water hazard, e.g. laundry premises.
- Where curtains or furniture may obstruct free air circulation.

Recommendations:

- Choose an area free from obstructions which may cause irregular air distribution and/or return.
- Check that the wall surface is flat enough to allow easy and safe installation.
  The wall structure should be strong enough to carry the unit weight and avoid deformation, rupture or vibration during operation.
- Consider using an area where installation is easy.
- Choose a position that allows for the clearances required (see drawing).
- Look for a position in the room which assures the best possible air distribution.
- Install unit in a position where condensate can easily be piped to an appropriate drain.

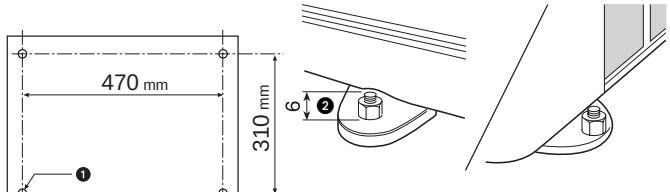
Outdoor unit

Positions to avoid:

- Too close to sources of heat radiation, vapour or flammable gas.
- Particularly dusty areas.

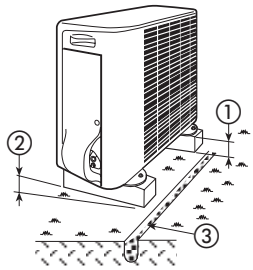
Recommendations:

- Choose a position protected from opposing winds.
- Choose a position sheltered from direct sun.
- Choose an area where air outlet and unit noise will not bother your neighbours.
- Choose a position that allows for the clearances required.
- Floor structure should be adequately strong to support unit weight and minimize vibration transmission.
- Consider a position which will not obstruct passageways or doors.



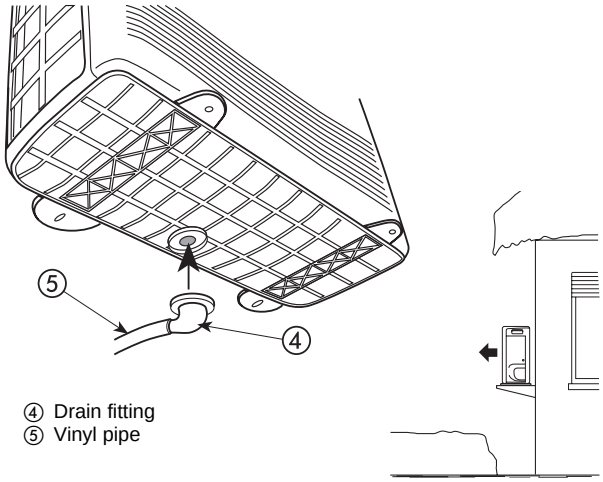
❶ No. 4 Ø 8 mm pins.
❷ Protrusion height from the support surface max. 6 mm.

- Fix the unit with locally purchased bolts buried in the block to prevent overturning due to strong gusts of wind.



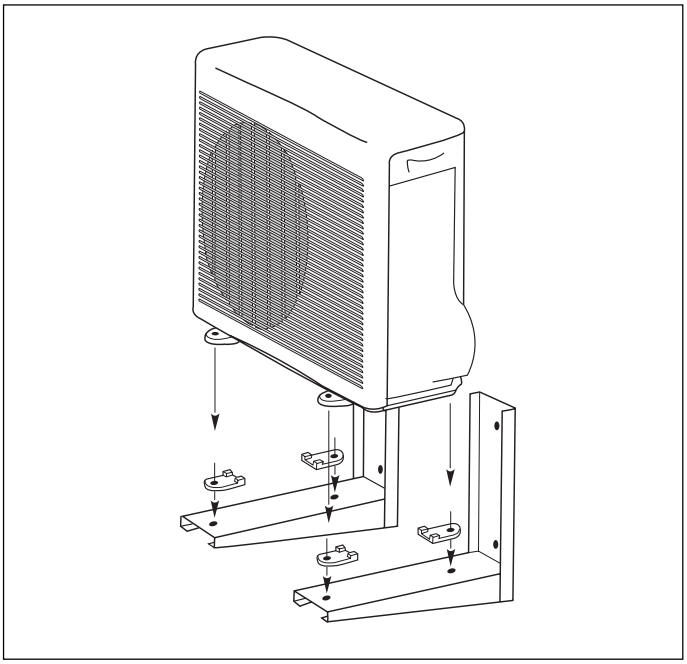
① 100 mm min.
② 20 mm gradient.
③ Gravel-filled trench.

- For heat pump models, unit must be adequately raised above floor surface.

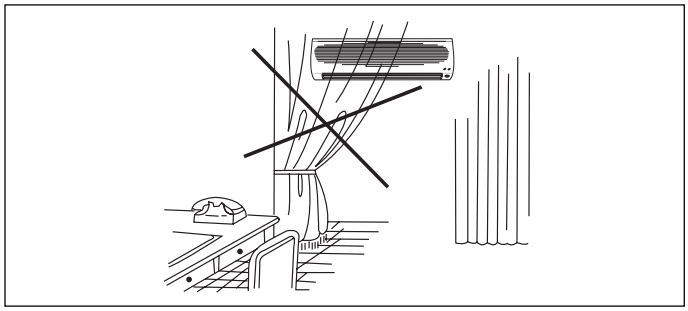


④ Drain fitting
⑤ Vinyl pipe

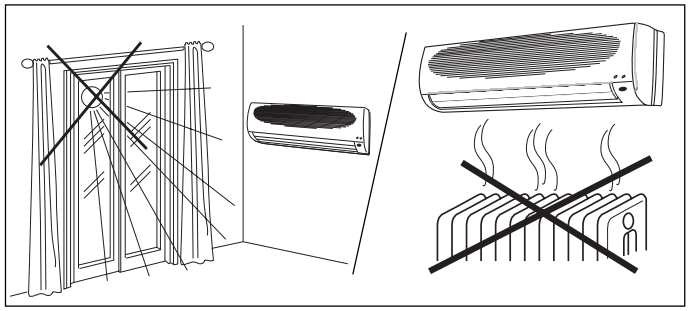
- To empty the condensate water to a drain while operating in heating mode, insert the drain fitting into the hole underneath on the centre of the base and use a vinyl pipe with a 16 mm inside diameter.
  It must not be used at temperatures below 0°C (not available for low temperature versions).
- If the unit is installed in areas where heavy snowfalls may occur, it is necessary to raise its level at least 200 mm above the usual snow level or alternatively to use the outdoor unit bracket kit.



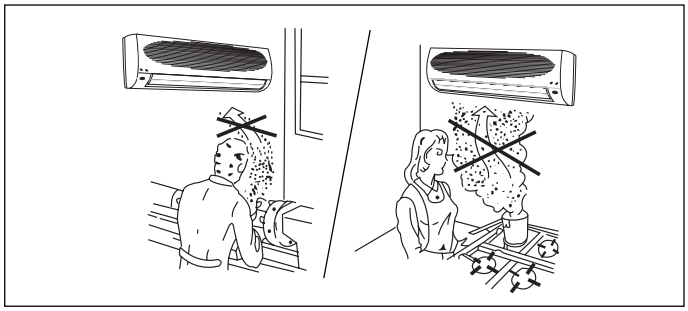
Warnings: avoid…



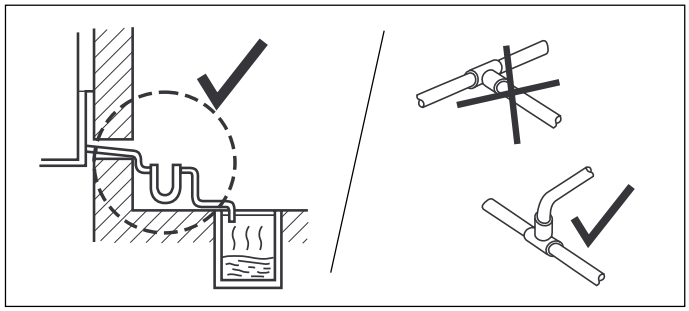
Any obstruction of the unit air outlet or return.



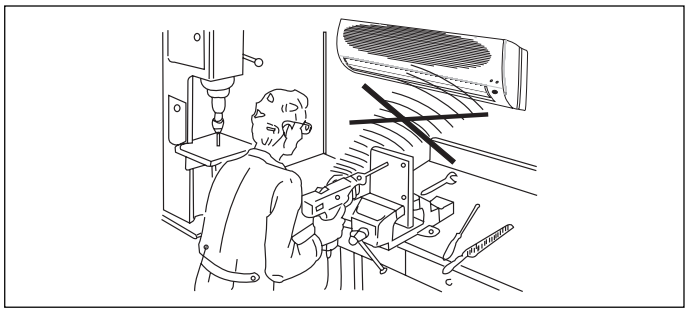
Exposure to direct sunshine, when unit is operating in cooling mode; always use shutters or shades.
Positions too close to heating sources which may damage the unit.



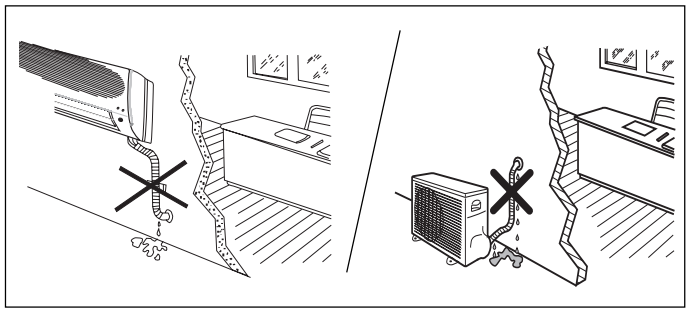
Exposure to oil vapours.



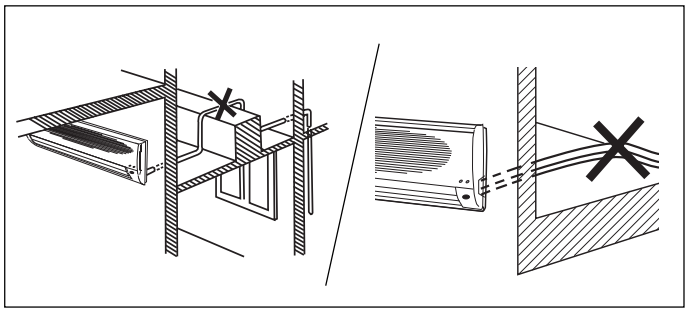
Connecting condensate piping to sewage system drain without appropriate trap. Trap height must be calculated according to the unit discharge head in order to allow sufficient and continuous water evacuation.



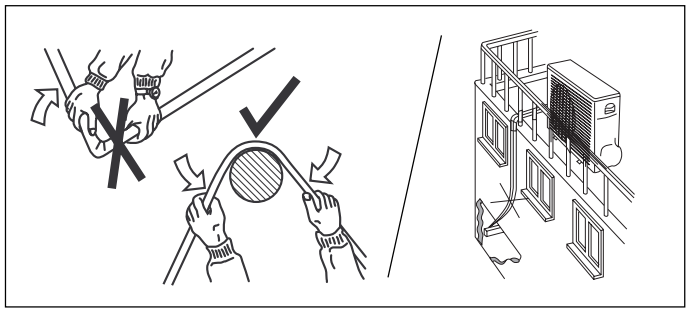
Installation in areas with high-frequency waves.



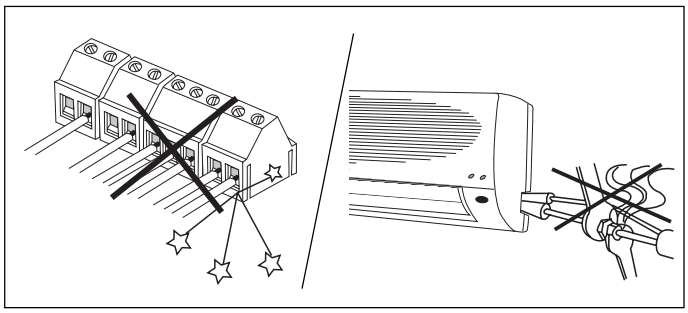
Only partial insulation of the piping.
Installation not correctly leveled which will cause condensate dripping.



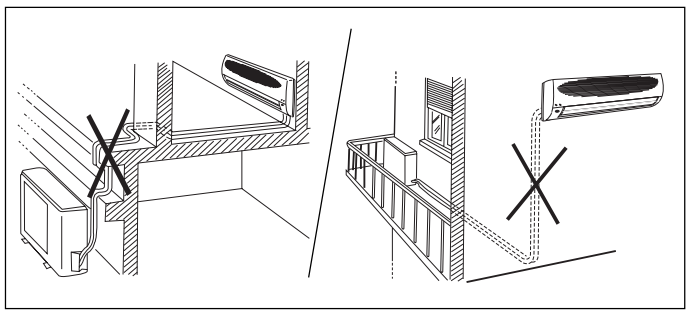
Any rise in the condensate drain piping.
Horizontal condensate drain piping with less than 2% slope.



Flattening or kinking the refrigerant pipes or condensate pipes.
Excessive height difference between outdoor and indoor units.

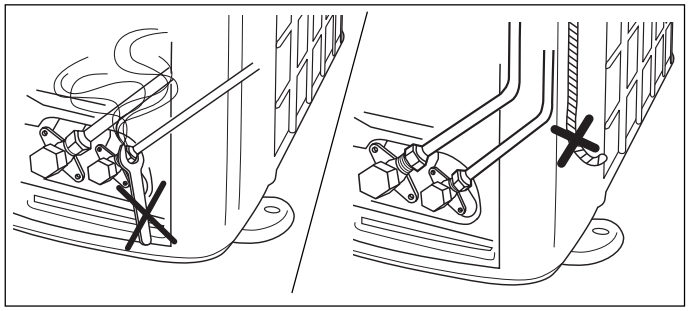


Slack on electrical connections. Disconnecting refrigerant connections after installation: this will cause refrigerant leaks.

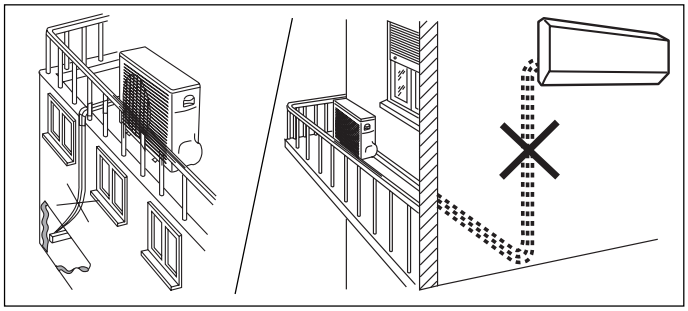


Unnecessary turns and bends in interconnecting tubing. Excessive interconnecting tube length.

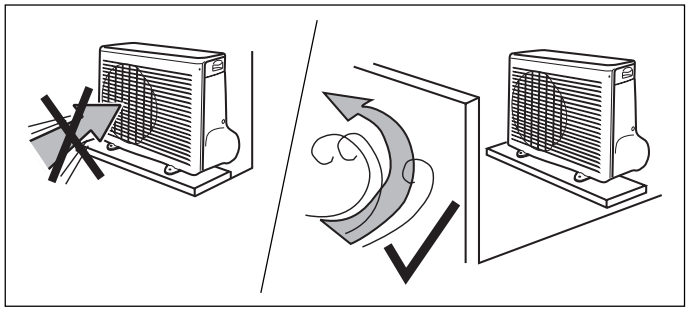
Warnings: avoid....



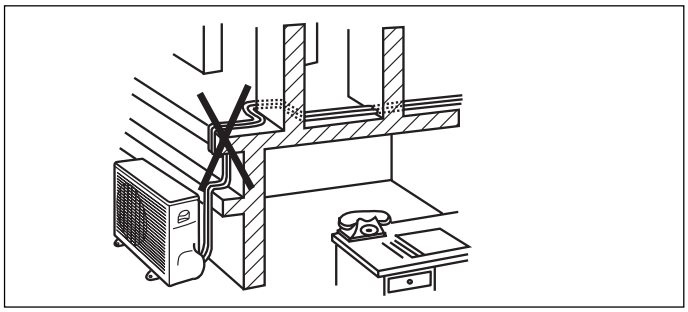
Disconnecting the refrigerant connections after installation: this will cause refrigerant leaks.
Connecting the condensate drain pipe to the outdoor unit.



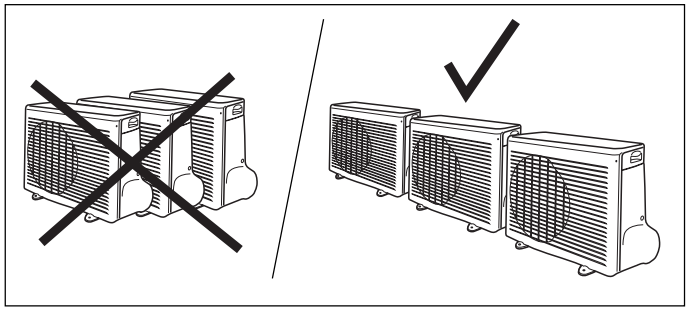
Excessive height difference between indoor and outdoor unit (see Table II "Connections"). Excessive distance between indoor and outdoor units. (see Table II "Connections").



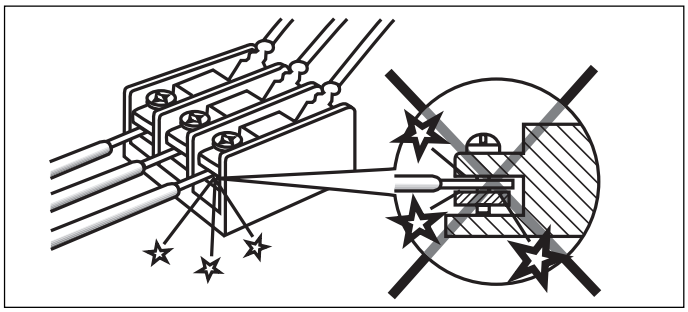
Predominant head winds.



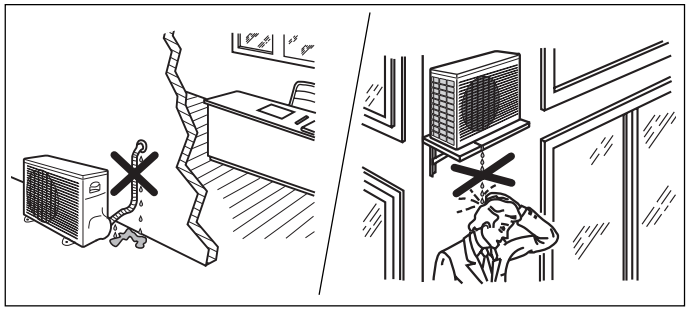
Unnecessary turns and bends in the connecting pipes.



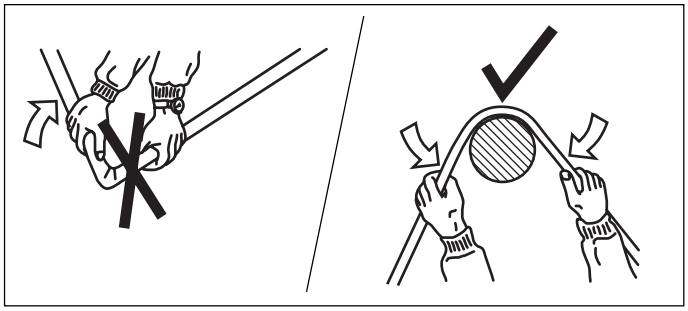
Multiple unit installation with units facing each other.



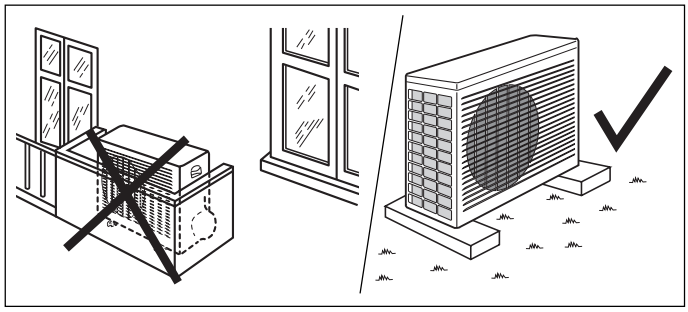
Any slack in the electrical connections.



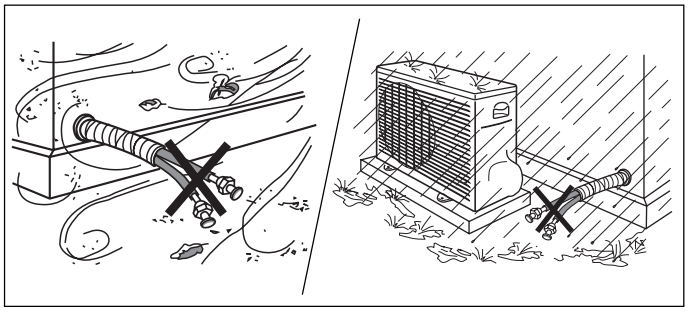
Insulating the connecting pipes only partially, which will cause dripping.
Dripping into passageways.



Flattening or kinking of refrigerant or condensate pipes.

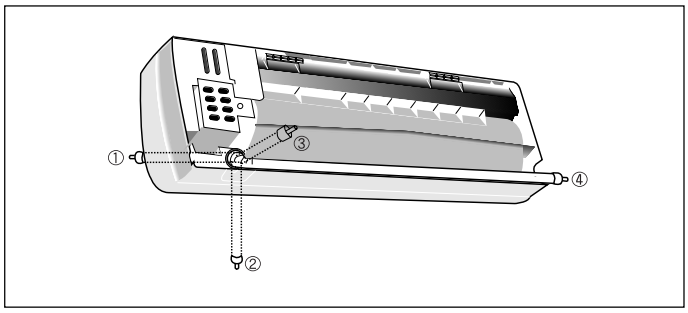


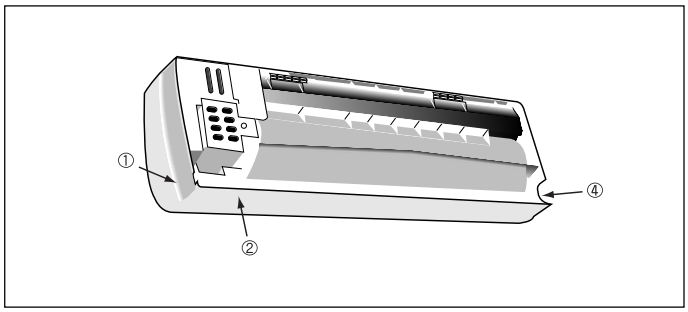
Any obstruction of the unit air outlet and intake or any obstacle that is too close (see minimum clearances required). Installation on grassy ground or soft surfaces (in these cases a solid foundation must be included).



Soiling of pipe ends.
Allowing piping to get wet before connection.

• The piping can be connected in the four ways indicated by ①, ②, ③ and ④.
When the piping is connected to points ①, ② or ④, remove the knock-out either at the side or at the bottom of the unit.

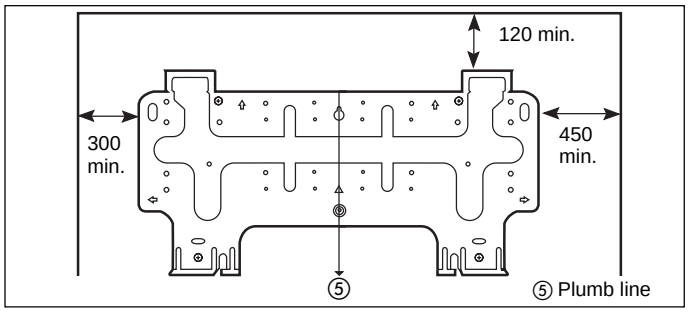


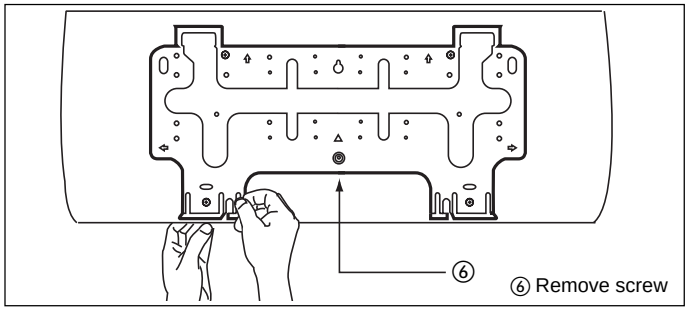


IMPORTANT NOTE:
Indoor unit has no refrigerant expansion device.

Installing the wall hanging bracket

• Install the wall hanging bracket so that it is level. Use a plumb line if necessary.
• Be sure to leave the clearance spaces. (Refer to page 4).
• If the wall hanging bracket is not level, water may drip onto the floor.
• Install the wall hanging bracket with a fixing that is strong enough to withstand the weight of the unit.





• Before installing the wall hanging bracket, remove it from the unit by pushing at the indicated parts at the bottom of the body.
• Fasten the wall hanging bracket to the wall with 4 or more screw anchors through the holes near the outer edge of the bracket.
• Install the wall hanging bracket so that there is no gap between the bracket and the wall.
• Check that the wall hanging bracket does not move.

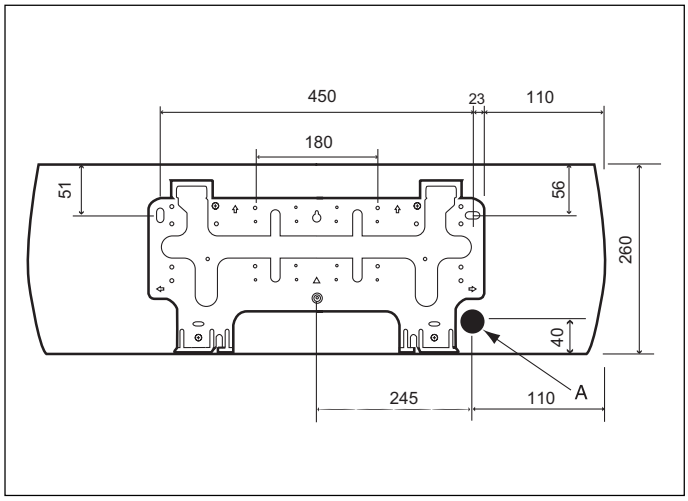
This can cause noise during operation.

• If the unit is removed from the wall hanging bracket after installing it onto the wall, remove it by pushing up the indicated MARKS (▲) at the bottom of the body. (Refer to page 10).

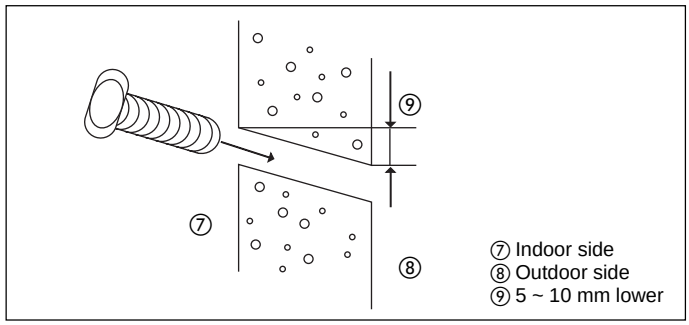
Marking the wall penetration for the connection piping

Rear piping

• It is best for the piping to go through the wall behind the unit, so that the unit hides the pipes.
• For this method of installation, make a 65 mm diameter hole in the wall at point **A**.



• Drill a 65 mm diameter hole at a slope so that the outside end is lower (5 - 10 mm) than the inside end.
This will ensure good drainage.
• Cut the wall sleeve to match the wall thickness and pass the pipe through the hole.



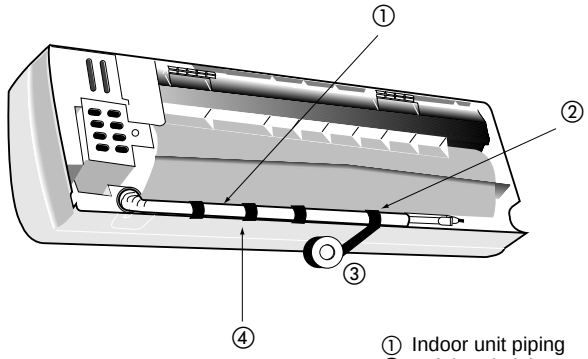
Side or bottom piping

• Remove the knock-out in the unit and pass the pipes through the wall.
• The pipe should slope downward and away from the unit to ensure good drainage.

Installation for indoor unit

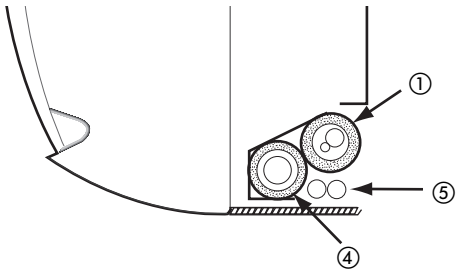
Routing the drain hose and refrigerant piping

- Tie together the refrigerant pipe, the drain hose, and the electrical connection cord.
- Route the refrigerant piping in the required direction, and bend carefully avoiding pipe deformation.
  Bind the drain hose and the electrical connection cord together with fastening tape.
  The drain hose should be at the bottom.

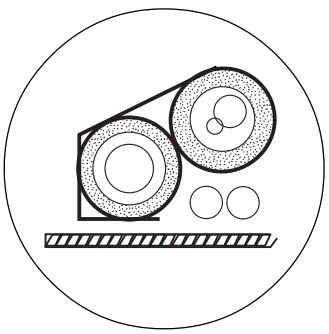


① Indoor unit piping
② Left-hand piping
③ Bind with fastening tape
④ Drain hose

- For left-hand piping, fit the pipes and the wiring into the recess at the back of the unit.

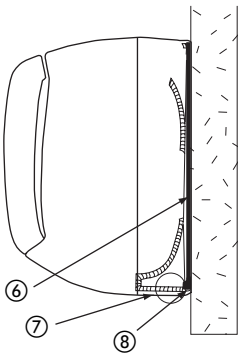


① Indoor unit piping
④ Drain hose
⑤ Connection cord

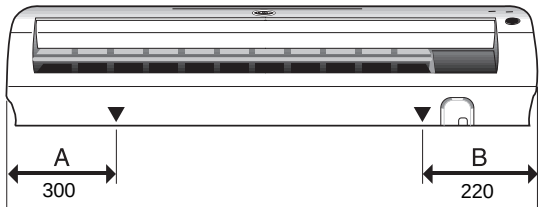


Installing the indoor unit body to the wall hanging bracket

- Pass the pipes through the wall sleeve and then hook the indoor unit body on top of the wall hanging bracket.
- For left-hand piping, hang the unit on top of the wall hanging bracket and incline the unit using a tool such as a screwdriver set between the middle area of the body and bottom right of the wall hanging bracket.
  Connecting the pipe can be done more easily if the unit is inclined.
- Fix the bottom part of the unit to the wall hanging bracket, by pushing it carefully unit the two bracket hooks fit into the marked places at the base of the unit (a click will be heard).

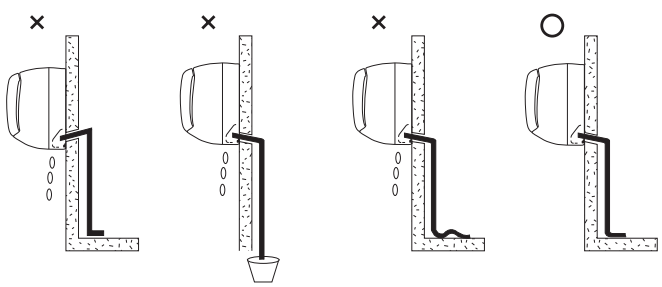


⑥ Wall hanging bracket
⑦ Hook
⑧ Hole

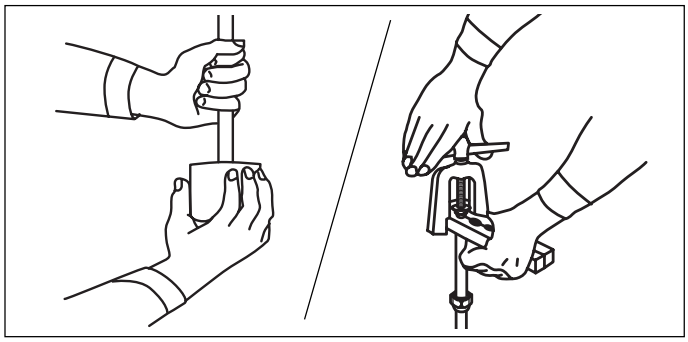


NOTE:

- Do not crush or kink the indoor piping. Avoid sharp bends with a bend radius of less than 100 mm.
- Do not bend the same part of the pipe too often.
- Do not remove the flare nut from the indoor unit pipe until the piping is connected.
- The recommended bending of the drain hose is shown.



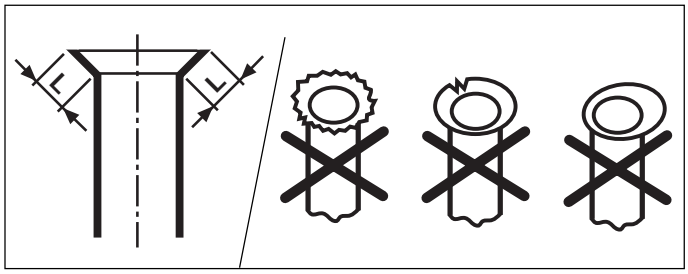
Flaring the ends of the tubing



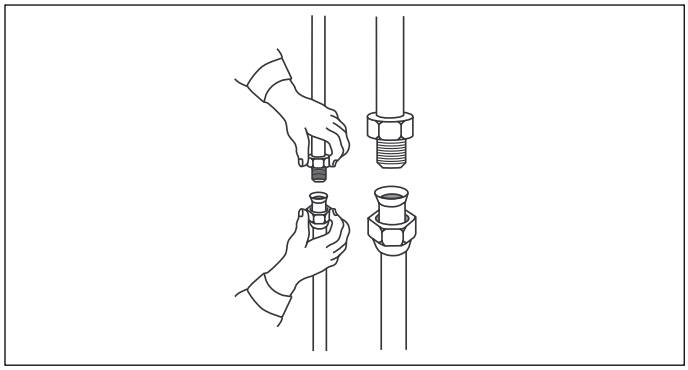
Remove protective caps from copper tube ends.
Position tube end downward, cut the tube to the requested length and remove the burrs with a reamer.

Do not leave system open to atmosphere any longer than minimum required for installation.
Oil in the compressor is extremely susceptible to moisture absorption.
Always keep ends of tubing sealed during installation.

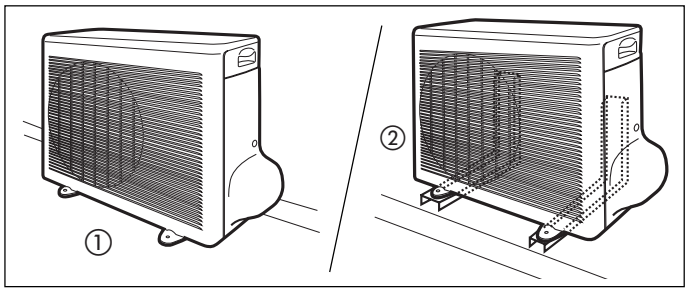
Remove flare nuts from the unit connections and place them on the tube end.
Flare the tube with the flaring tool.



Flare end must not have any burrs or imperfections.
The length of the flared walls must be uniform.

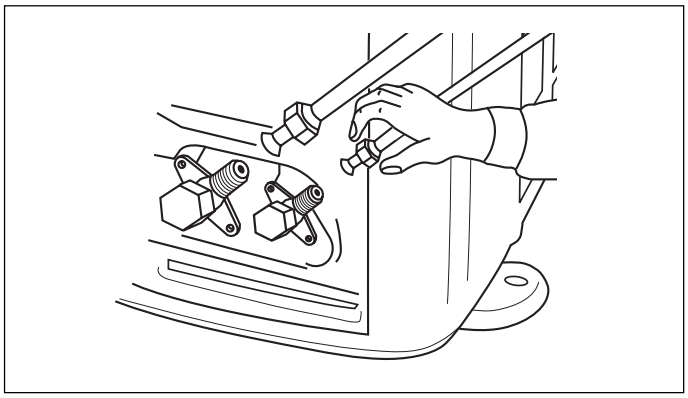


Lubricate the tube end and thread of the flare fitting with anti-freeze oil.
Finger-tighten the fitting several turns, then tighten it fully with two wrenches by applying the tightening torque indicated in the table.



The unit can be installed:
① on the floor;
② on the wall using the bracket kit.

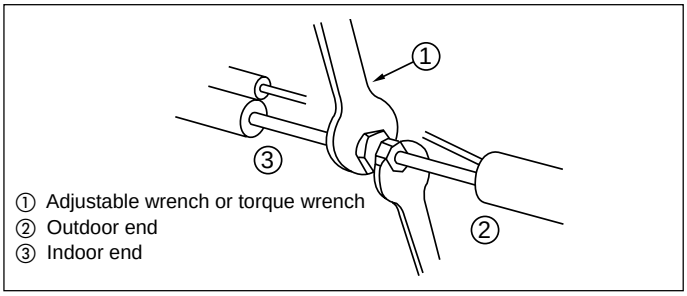
Connect tubing in accordance with the limits shown on Table II (Connections).
Finger-tighten the fitting several turns, then tighten it with a wrench by applying the tightening torque indicated in the table.



IMPORTANT:
Open the three way valves only after fitting has been tighten.

Connection to unit

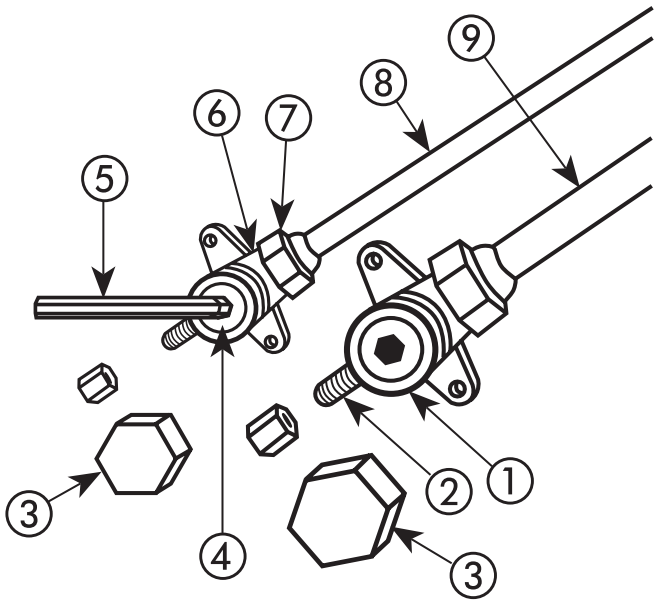
Insufficient tightening torque will cause gas leaks.
Overtightening the fittings will damage the tube flaring and cause gas leaks.

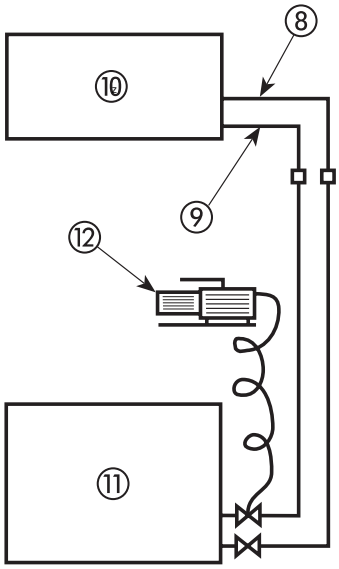


① Adjustable wrench or torque wrench
② Outdoor end
③ Indoor end

Tightening torque										
Valve	Flare nut		Valve cap		Pressure port cap		Valve needle		Pressure port	
	Wrench mm	Nm	Wrench mm	Nm	Wrench mm	Nm	Wrench mm	Nm	Wrench mm	Nm
1/4”	17	18	22	20	-	-	Allen(hex.)4	9	-	0.34
3/8”	22	42	22	20	17	16-18	Allen(hex.)4	9	-	0.34
1/2”	27	55	25	40	17	16-18	Allen(hex.)4	13	-	0.34

Air purging





① Three-way valve (liquid)
② Needle valve
③ Valve cap
④ Valve needle
⑤ Allen (hex. head) wrench
⑥ Three-way valve (liquid)
⑦ Flare nut
⑧ Liquid line (small diameter)
⑨ Gas line (large diameter)
⑩ Indoor unit
⑪ Outdoor unit
⑫ Vacuum pump

Use only a vacuum pump to purge air from the piping.

NEVER use the system compressor as a vacuum pump.

NEVER use the unit refrigerant gas to purge the connecting pipes.

No additional refrigerant has been provided in the unit for this purpose.

Remove the caps from the three-way valves.

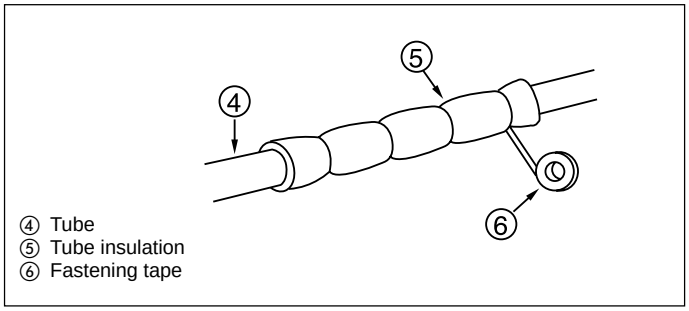
Create a vacuum with a vacuum pump connected to the service connection of the suction shut-off valve (gas), as shown, keeping the shut-off valves completely shut until a 50 Pa (0.5 mbar) vacuum has been reached.

Now open the liquid valve for 3 seconds, then quickly shut it to check for possible leaks.

After the leak check, fully open the three-way valves.

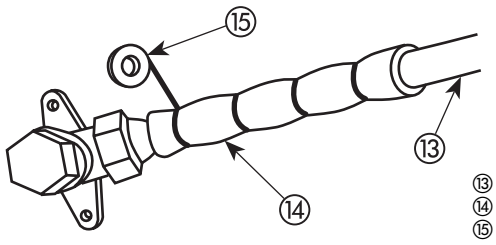
Replace caps and check for leaks.

Once all connections have been completed, check for leaks by using a leak detector specific for HFC refrigerants.

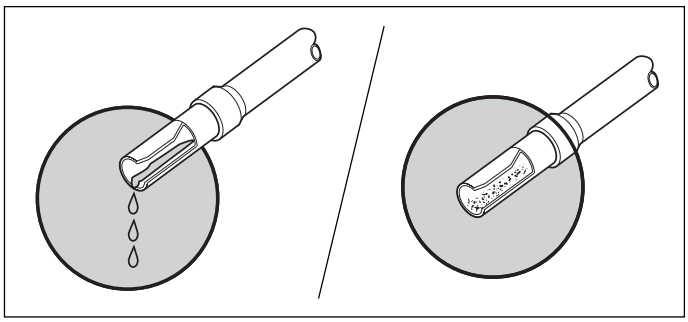


④ Tube
⑤ Tube insulation
⑥ Fastening tape

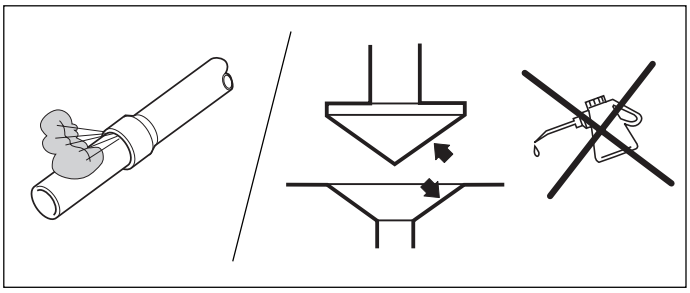
Once all connections have been completed, check for leaks by applying soapy water to them.
Finally wrap connections with anti-condensate insulation and tighten with tape, without exerting great pressure on the insulation.
Repair and cover any possible cracks in the insulation.
Connection pipes and electric cables between indoor and outdoor units must be fixed to the wall with appropriate conduits.



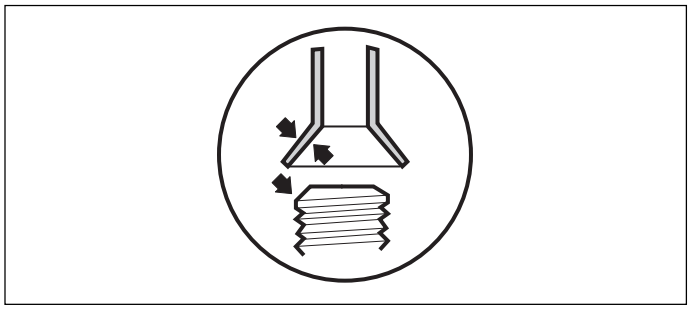
⑬ Pipe
⑭ Pipe insulation
⑮ Fastening tape



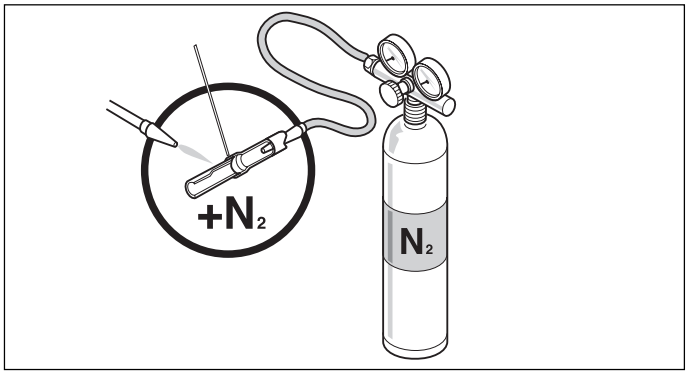
No moisture.
No dust.



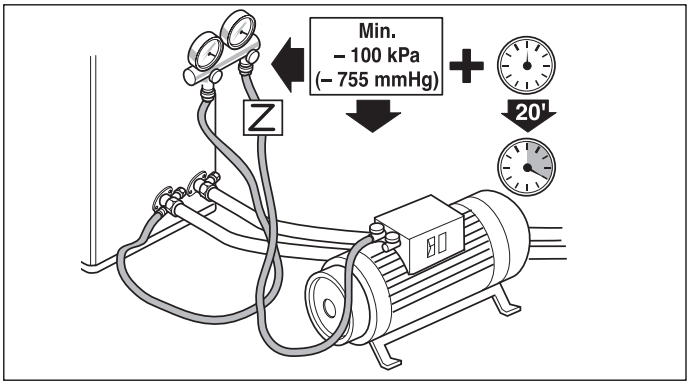
No leak.
No mineral oil.



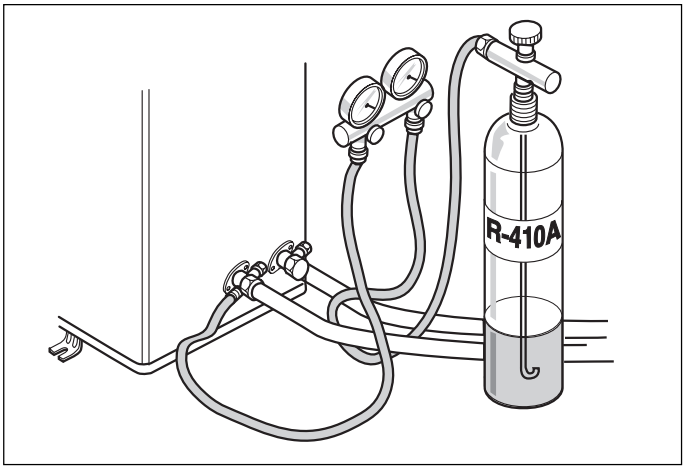
Neat.



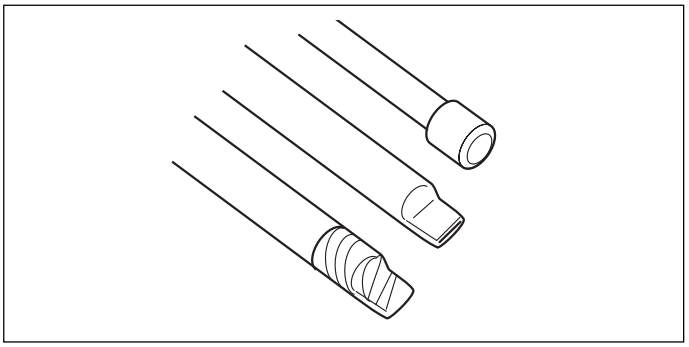
Dry nitrogen brazing.



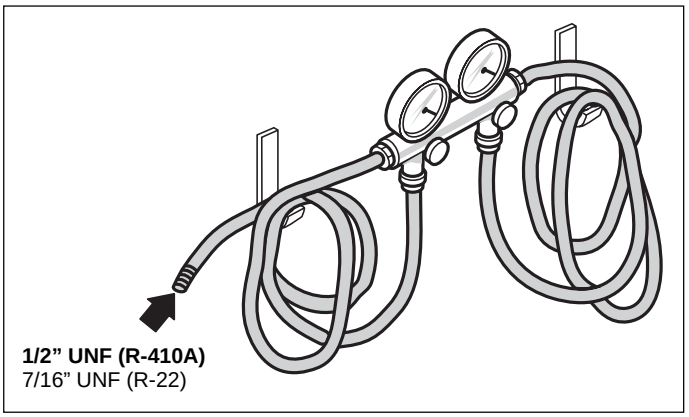
Vacuum.



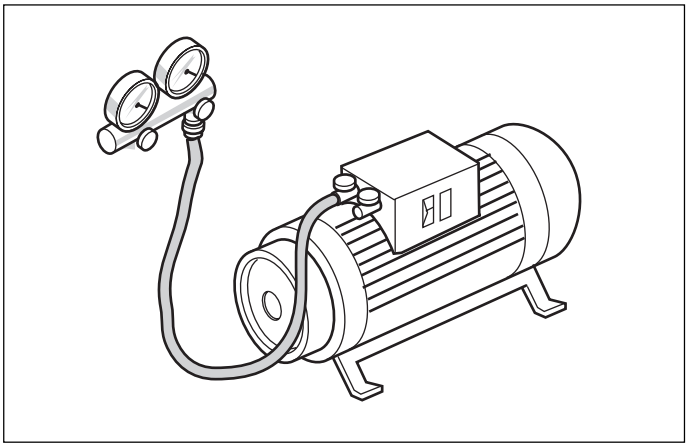
Charge liquid-no gas.



Copper tubes during storage.

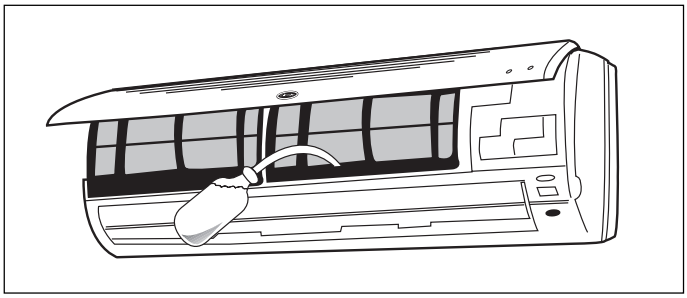


Use tools designed for R-410A higher pressure.
Keep inside clean.



2-stage vacuum pump. Replace oil regularly.

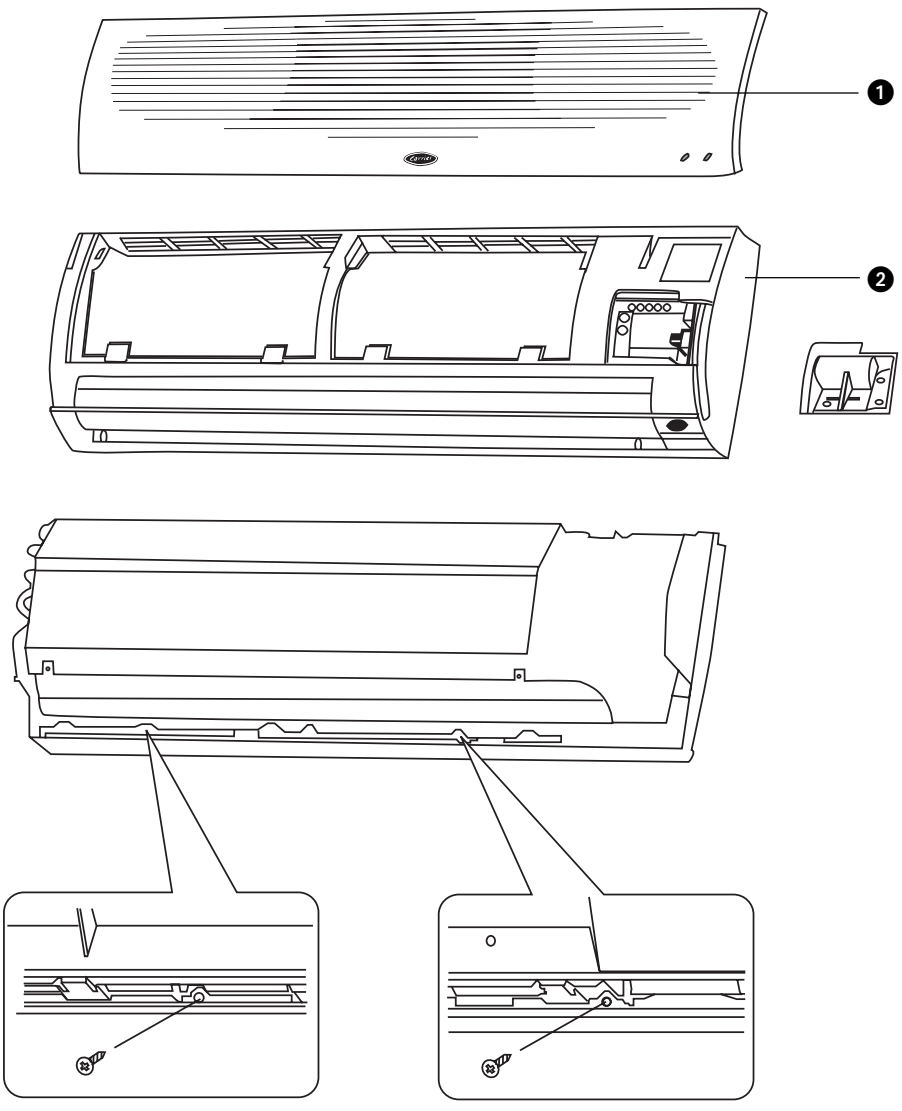
Check



• Next, check the unit drain system by pouring some water into the unit drain pan and ensuring that it flows freely through the drain hose and that there is no leakage from any other part.

Use of additional screws

After installation, if there is a significant gap between the unit and wall, it can be adjusted by securing the body to the wall hanging bracket using 2 screws.
Screw holes can be only seen after removing the frame grille.



1 Grille
2 Front panel

42PQV/38VBH

Electrical connection for indoor unit

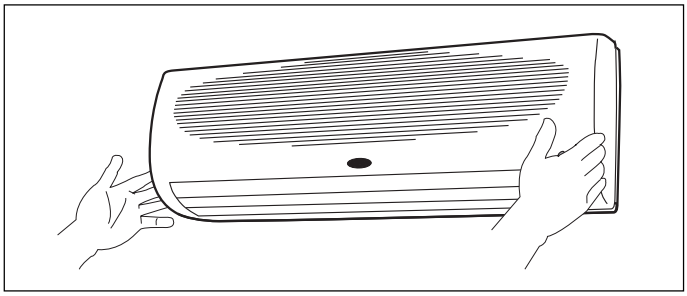
GB
ENGLISH

IMPORTANT:

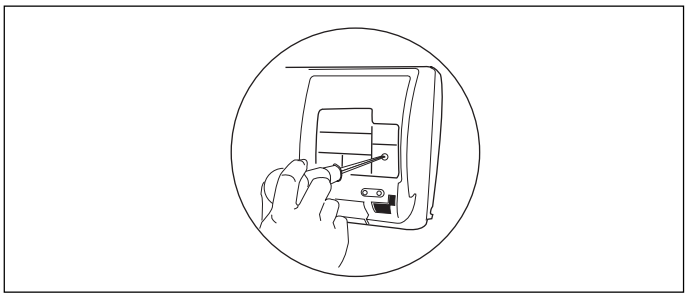
- **Make refrigerant connections before electrical connections.**
  When disconnecting, disconnect electrical connections before refrigerant connections.
- **Make ground connection prior to any other electrical connections.**

- The mains supply must be connected to the indoor unit.
- Make electrical connections between units prior to proceeding to mains supply unit connection.
- Connect the wires to the terminals according to the wiring diagram and firmly tighten.
- Before proceeding with the connection to the mains supply locate live **L** and neutral **N**, then make connections as shown in the wiring diagram.
- Check that the impedance of the mains power supply is in conformance with the unit power input indicated on the electric data table IV.
- Ensure that mains supply connection is made through a switch that disconnects all poles, with contact gap of a least 3 mm.
- The indoor - outdoor unit connecting wires must be H07 RN-F type (or higher), with synthetic rubber insulation with Neoprene coating, according to EN 60335-2-40 codes.
- The mains supply connecting cable must be H07 RN-F type (or higher), with synthetic rubber insulation with neoprene coating, according to EN 60335-2-40 codes.

Notes:
All field electrical connections are the responsibility of the installer.

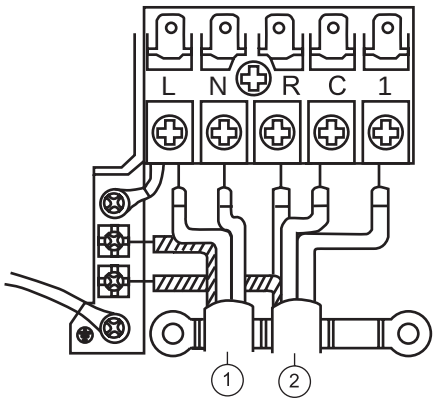


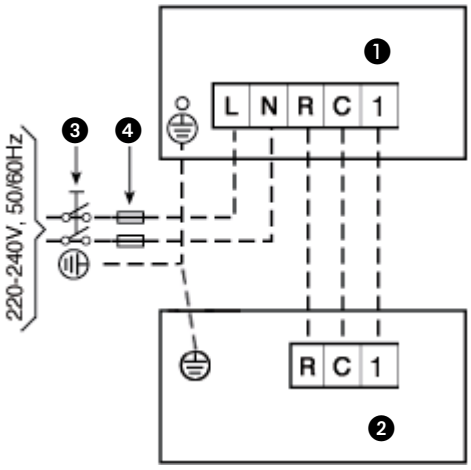
- Lift the front panel up to the top of the unit; in this way the front panel will be separated from the unit.



- Remove the plastic cover of the terminal board.
- Make the electrical connections to the terminal board as per the wiring diagram.
- When the electrical connections are completed, refit the terminal board cover and fix the cables with the special cable holders.
- Fix the front panel to the latch of the frame grille.

Indoor unit wiring





Minimum connection wire size (mm²)						
Model	**L**	**N**	**R**	**C**	**1**	⏚
009, 012	**1.5**	**1.5**	**1.5**	**1.5**	**1.5**	**1.5**

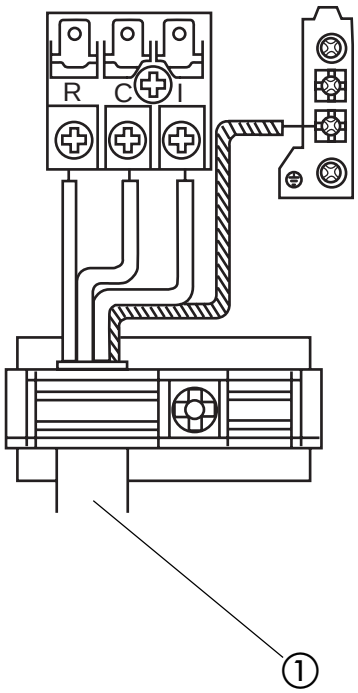
Terminal box legend, all models
L Live power supply
N Neutral power supply
R Live connection indoor/outdoor unit.
C Neutral connection indoor/outdoor unit.
1 Communication, indoor-outdoor units.
⏚ Earth

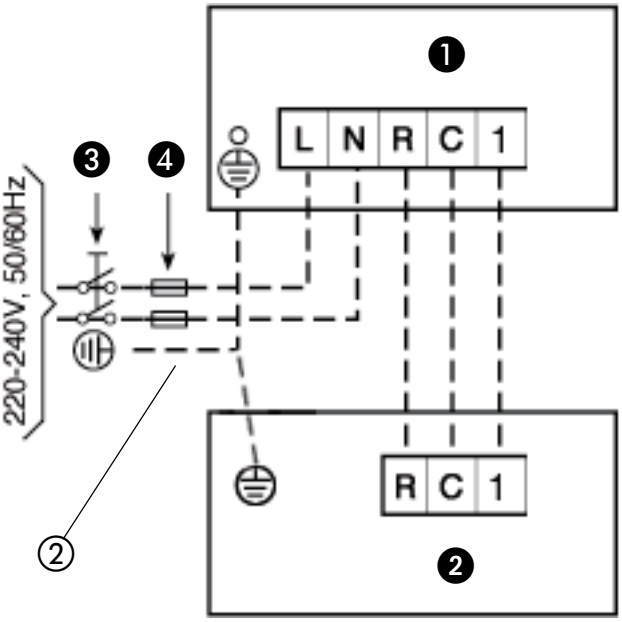
① Power supply
② Connecting cable, indoor-outdoor units.

❶ Indoor unit
❷ Outdoor unit
❸ Main switch
❹ Time-delay fuse or circuit breaker

Electrical connection for outdoor unit

38VBH- 009 - 012



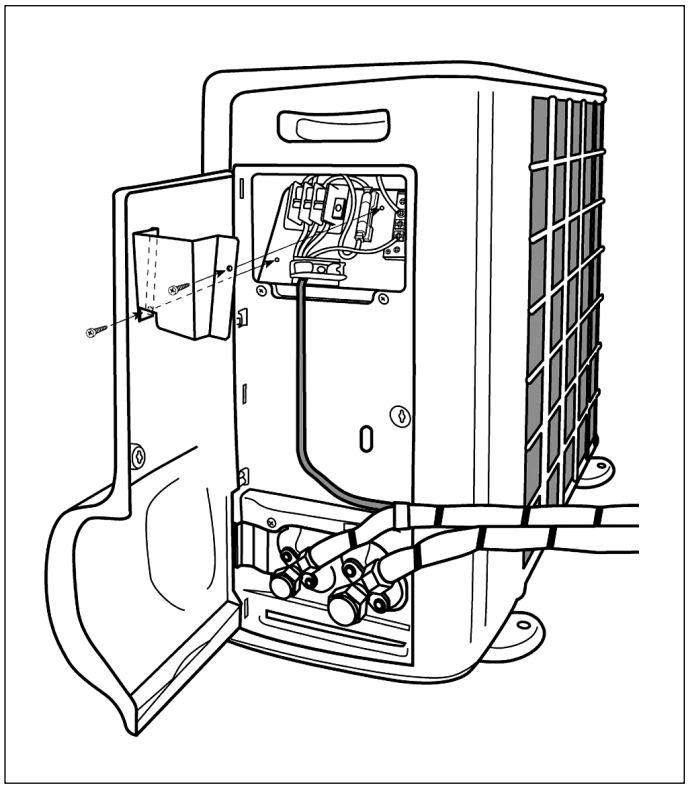


Terminal box legend

⏚ Earth
L Live power supply
N Neutral power supply
R Live connection indoor-outdoor units
C Neutral connection indoor-outdoor units
I Communication, indoor-outdoor units.

① Connecting cable, indoor-outdoor units (field wiring).
② Mains supply connecting cable (field wiring).

❶ Indoor unit
❷ Outdoor unit
❸ Main switch
❹ Time-delay fuse or circuit breaker (see table IV "Electrical data").



IMPORTANT:
Make ground connection prior to any other electrical connections.

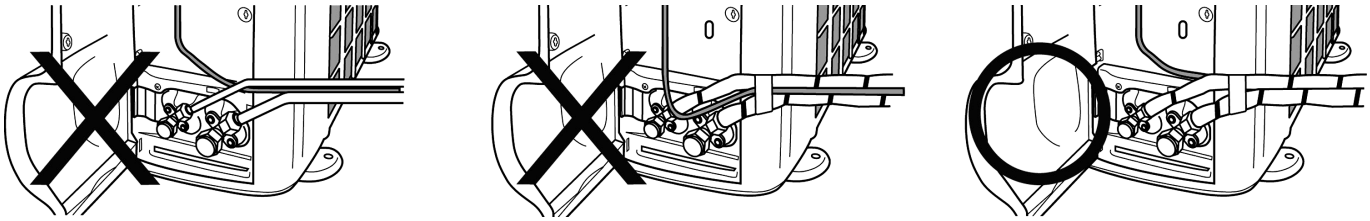
When disconnecting, disconnect electrical connections before refrigerant connections.

The mains supply must be connected to the indoor unit.

- Open control box panel (valve cover panel).
- Make electrical connections between units prior to proceeding to mains supply unit connection.
- Connect the wires to the terminals according to the wiring diagram and firmly tighten.
- Before proceeding with the unit connection to the mains supply locate live **L** and neutral **N**, then make connections as shown in the wiring diagram.
- Check that the impedance of the mains power supply is in conformance with the unit power input indicated on the electric data table IV.
- Ensure that mains supply connection is made through a switch that disconnects all poles, with contact gap of a least 3 mm.
- The indoor - outdoor unit interconnecting wires must be H07 RN-F type (245 IEC 57) or higher, with synthetic rubber insulation with Neoprene coating, according to EN 60335-2-40 codes.
- The mains supply connecting cable, must be H07 RN-F type (245 IEC 57) or higher, with synthetic rubber insulation with Neoprene coating, according to EN 60335-2-40 codes.™

Notes:

1. **All field electrical connections are the responsibility of the installer.**



Never be in contact any other electrical connections with naked refrigerant tube and service valve in order to avoid electrical connection damage due to hot refrigerant tube.

Table IV: Electrical data

	Power input								Main power connections (4)		Indoor-outdoor unit
	Cooling				Heating						
	Nominal conditions 230V ~ 50Hz ISO 5151.2/T1 indoor 27°C d.b. 19°C w.b. outdoor 35°C d.b. 24°C w.b.		Peak conditions 198V ~ 50Hz ISO 5151.2/T1 indoor 32°C d.b. 23°C w.b. outdoor 43°C d.b. 32°C w.b.		Nominal conditions 230V ~ 50Hz ISO 5151.2/High+ indoor 20°C d.b. 15°C w.b. outdoor 7°C d.b. 6°C w.b.		Peak conditions 198V ~ 50Hz ISO 5151.2/High+ indoor 27°C outdoor 24°C d.b. 18°C w.b.		Time-delay fuse gL type	Wire size (2)	Wire size (2-3)
Heat pump	**A**	**W**	**A**	**W**	**A**	**W**	**A**	**W**	**A**	**mm²**	**mm²**
38VBH-009	3.9	852	5.4	1010	4.2	950	5.3	1020	20	1.5	1.5
38VBH-012	5.2	1140	7.1	1370	5.8	1310	9.1	1745	20	1.5	1.5

Notes:
1. **Outdoor unit is suitable for outdoor installation.**
2. Wire size shown applies to line length up to 15 m.
3. The indoor - outdoor unit interconnecting wires must be H07 RN-F type (245 IEC 57) or higher, with synthetic rubber insulation with Neoprene coating, according to EN 60335-2-40 codes.
4. The mains supply connecting cable must be H07 RN-F type (245 IEC 57) or higher, with synthetic rubber insuluation with Neoprene coating, according to EN 60335-2-40 codes.

42PQV/38VBH

Pump Down and refrigerant cycle

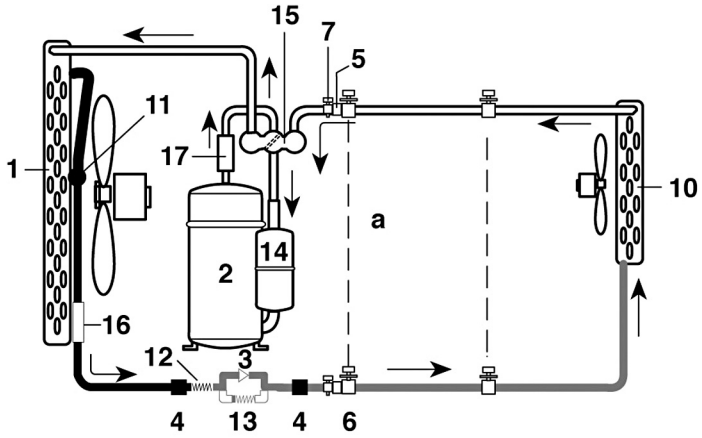
Pump-down

Pump-down is an operation intended to collect all the system refrigerant in the outdoor unit.
This operation must be carried out before disconnecting the refrigerant tubing in order to avoid refrigerant loss to the atmosphere, if it becomes necessary to disconnect the refrigerant connections for unit repair, removal or disposal in this case, after removal, unit must be delivered to an appropriate disposal centre or the original dealer.

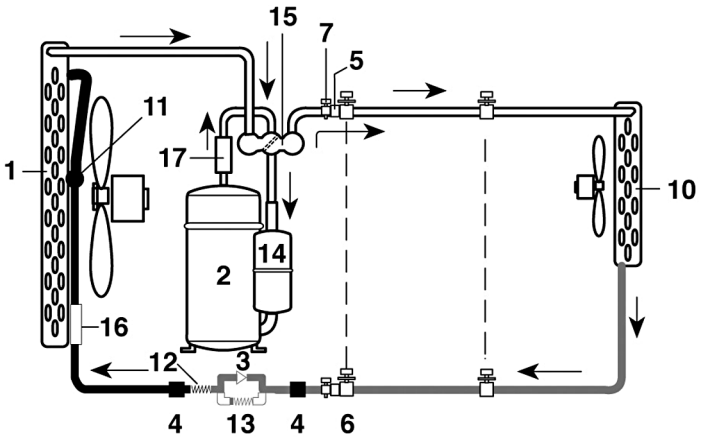
Shut off the liquid valve with the Allen wrench.
Turn the system on in cooling with fan operating at high velocity.
(Compressor will immediately start, provided 3 minutes have elapsed since the last stop).
After 2 minutes of operation, shut the suction valve with the same wrench.
Turn the system off and switch mains supply off.

Disconnect tubing.
After disconnection, protect valves and tubing ends from dust.

Refrigerant Cycle
Heat pump unit



Cooling cycle



Heating cycle

Legend:

① Outdoor coil
② Compressor
③ Check valve
④ Strainer
⑤ Vapor valve
⑥ Liquid valve
⑦ Service pressure port
⑩ Indoor until coil
⑪ Liquid distributor
⑫ Cooling + Heating expansion device
⑬ Heating expansion device
⑭ Additional suction acumulator
⑮ Reversing valve
⑯ Filter drier
⑰ Discharge muffler

Gas
Liquid + Gas
Liquid

Operating test

- Perform the operating test after the units have been installed in position and the gas leak test has been completed.
- Check all electrical connections(instructions and wiring diagram).
- Insert the batteries into the remote control and leave it OFF.
- Energies the system, turning the power supply ON.
- Press the ∧ and buttons of the infrared remote control and hold them pressed for more than 5seconds.
  The display will be cleared, the time segments will display the icon (Src1=service test).
- Press button to transmit the service test signal to the unit.
  After test has been completed, press ⏻ button to leave the test menu.

Note:
When 30 minute have elapsed and no buttons have been pressed, the remote control
will automatically exit the test menu and resume its normal operation.

Address selector

If you are installing two indoor units in the same room and you want them to operate in independent mode, it is necessary to assign each unit its own address so that each unit can operate via its own remote control.

For configuration, proceed as follows:

Configuration (of the unit)

- Press the M and buttons of the infrared remote control and hold them pressed for more than 5 seconds.
- The display will be cleared, the time segments will display the first configuration item (rAdr=remote address) and the temperature segments will display the default value of this configuration item (Ab=control of both indoor units).
- Press either the ∧ or ∨ button to change the default value (Ab) to the new value (A) or (b).
- Press button to transmit the new configuration to the unit.
- Press ⏻ button to leave the configuration menu.

Configuration (of the remote controller)

- Press the ∨ and buttons of the infrared remote control and hold them pressed for more than 5 seconds.
- The display will be cleared, the temperature segments will display the first configuration item (CH=remote address) and the time segments will display the default value of this configuration item (Ab=control of both indoor units).
- Press either the ∧ or ∨ button to change the default value (Ab) to the new value (A) or (b).
- Press button to transmit the new configuration to the unit.
- Press ⏻ button to leave the configuration menu.

Note:
When 30seconds have elapsed and no buttons have been pressed, the remote control will automatically exit the configuration menu and the procedure has to be restarted.

Fault code

Once a failure occurs with the indoor unit in operation, the green or orange LED flashes at intervals of 0.5 seconds. The fault code is deduced from the number of times the green LED or orange LED flashes, blocking unit operation. Between one flash cycle and the next one, a pause of 3 seconds elapses.

Table V : Fault code

Green LED (indoor unit fault)

Code	Description
2	Room air sensor fault
3	Indoor unit coil sensor fault
7	Indoor-outdoor units communication fault
8	Indoor fan motor fault
Continuance	Indoor sensor wiring reversed

Orange LED (outdoor unit fault)

Code	Description
1	Outdoor sensor fault
2	Indoor-outdoor units mis-matching
3	4way valve fault
4	Outdoor fan motor fault
5	Inverter control fault
6	Power module(IGBT) fault
7	Indoor-outdoor units communication fault

Table VI: Unit configuration

ITEM	Shown on display	Explanation	Description
1	"rAdr"	"A" remote unit A "b" remote unit B "Ab" remote unit A and b	Remote address indoor unit A. Remote address indoor unit B. Default address both indoor unit.
2	"UCFG"	"HP" heat pump "AC" cooling only	Default address is heat pump. Change address for cooling only.
3	"UAdr"	1-$_2$40 with increase of 1	CCN unit address. Deafault=1
4	"ZONE"	1-$_2$40 with increase of 1	Number of zone. Deafault=0
5	"GFdn"	1-$_2$40 with increase of 1	Number of GFD. Deafault=1
6	"A St"	"OF":unit in stop mode	Choose of operating mode after a power supply interruption.

Note:
The selections of item 2, 3, 4 and 5 are not changeable in the unit even though remote control selections for these items are possible.

Table VII: Remote configuration

Shown on display	Explanation	description
"CH"	"A":unit A "b":unit B "Ab":unit A and B	Address indoor unit A. Address indoor unit B. Default address is both indoor units.
"tU"	"C":Degrees Celsius "F":Degrees Fahrenheit	Temperature. Default is °C.
"rc"	"HP":heat pump "AC":cooling only	Default address is heat pump. Change address for cooling only.
"HR"	17-32:17°C~32°C 63-90:63°F~90°F	Maximum heating setpoint in °C. Maximum heating setpoint in °F.
"CR"	17-32:17°C~32°C 63-90:63°F~90°F	Minimum cooling setpoint °C. Minimum cooling setpoint °F.
"CL"	12:12hour clock (AM/PM) 24:24hour clock	Time format (AM=morning; PM=afternoon). Default is 12.

Note:
If the selection is changed from "rc" (HP operation) to cooling only and the remote control operating mode is auto or heating, the operating mode is set to cool.

Note:
If the "HR" is set to a value that is lower than "CR" and the remote control operating mode is auto, the operating mode is set to cooling.

Guide for the owner

When installation and tests are completed explain the Operation and Maintenance Manual to the owner, with particular attention to the main operating modes of the air conditioner, such as:

- Turning the unit on and off.
- Functions of the remote control.
- Removal and cleaning of the air filters.

Leave the installation manual with the owner for future use during maintenance operations or for any other needs.

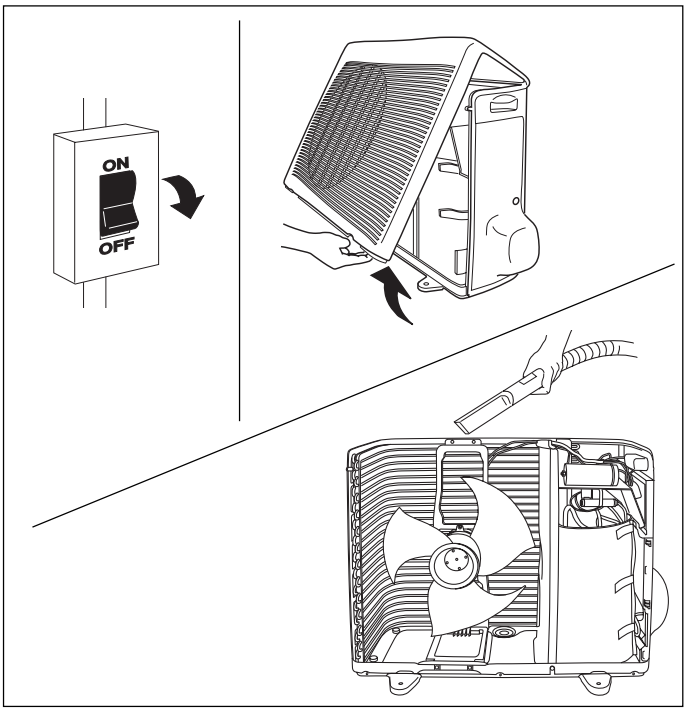
Table VIII : Accessories

Description	42PQV/38VBH	
	009	012
Wall bracket kit	•	•
Active carbon filter and Passive electrostatic filter	•	•

Unit maintenance

The following maintenance operations must be carried out by qualified personnel.

Cleaning the coil
When necessary, proceed as follows for more careful cleaning of the coil:



Switch the mains supply OFF.

Remove unit front panel complete with top cover by loosening holding screws and lifting as shown.
Carefully clean the coil with a vacuum cleaner from inside to outside.
With the same vacuum cleaner, dust the inside of the fan compartment and the fan blades.
Avoid any damage to the blades which may cause future vibrations and noise.
Replace the unit front panel with cover and tighten the screws.

Troubleshooting

Compressor and fan of the outdoor unit will not start:

- Unit not energized; check the mains power connections.
- Main switch OFF; check and put to the ON position.
- Main switch fuses have blown; replace.
- Wait for 3 minutes; compressor cycling protection is on.
- Mains voltage too low.
- Electrical connections loose or wrong; check and repair.

Compressor will not start, but outdoor fan is running:

- Electrical connections of compressor loose or wrong; check and repair.
- Compressor burnt out, seized or protection device on; check for the cause and replace compressor if necessary.

Compressor starts, but stops due to its overtemperature protection (other than stops caused by the normal operation of the thermostat):

- Wrong refrigerant charge (excessive or low) or air or other non condensable gases in the circuit; drain refrigerant (see note 1), evacuate and recharge.
- Mains voltage wrong (too high or too low).
- Condenser coil (outdoor or indoor, in case of heat pump operation) obstructed; remove obstructions.
- Outdoor fan off; check cause and repair.
- Wrong indoor unit thermistors replace.
- Refrigerant circuit clogged; check and remove obstructions.
- Reversing valve faulty on heat pump models; replace.
- Expansion device clogged or covered with ice; drain refrigerant (see note 1), evacuate and recharge.

Compressor runs continuously:

- Unit selected too small for actual air conditioning needs.
- Indoor temperature selection too low (if in cooling) or too high (if in heating, for heat pump models); check temperature selection.
- Outdoor unit fan faulty; replace.
- Air or other non condensable gases in the circuit; drain refrigerant (see note 1), evacuate and recharge.

- Obstructions at air intake or dirty indoor unit filters; remove obstruction or clean filter.

Frequent ice build-up on outdoor coil (during heating with heat pump units):

- Outdoor fan stopped; check cause and repair.

Discharge pressure too high:

- Outdoor coil dirty or obstructed; clean or remove obstructions.
- Condenser fan (outdoor or indoor, in case of heat pump operation) faulty; replace.
- Indoor temperature selection too low in cooling or too high in heating; check temperature selection.
- Air or other non-condensable gases in the circuit; drain refrigerant (see note 1), evacuate and recharge.

Discharge pressure too low:

- Indoor temperature selection too high in cooling or too low in heating; check temperature selection.
- Outdoor coil dirty or obstructed; clean or remove obstructions.
- Indoor unit air filter dirty; clean filter.

Suction pressure too high:

- Indoor temperature selection too low in cooling or too high in heating; check temperature selection.
- Reversing valve (on heat pump models) faulty or internal leak; replace.

Suction pressure too low:

- Indoor temperature selection too high in cooling or too low in heating; check temperature selection.
- Evaporator coil (indoor or outdoor, in case of heat pump models),covered with ice; see the following points.
- Air circulation on the evaporator unit (indoor or outdoor, in case of heat pump models) not sufficient; check for the cause and repair.
- Expansion device or suction line clogged: check and repair.
- Outdoor fan does not stop during defrost periods (when heating with heat pump models); check electrical parts.

Outdoor fan cycling due to its overtemperature protection:

- Electrical connection loose; check connections.
- Fan motor burnt out; replace.
- Fan bearing seized; check and repair.
- Expansion device clogged or covered with ice; drain refrigerant (see note 1), evacuate and recharge.

Note 1:
Do not release refrigerant to the atmosphere; use refrigerant recovery equipment.

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The manufacturer reserves the right to change any product specifications without notice.

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